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*Published in:*  
JAMA Network Open

*DOI:*  
[10.1001/jamanetworkopen.2020.14355](https://doi.org/10.1001/jamanetworkopen.2020.14355)

*Publication date:*  
2020

*Document version*  
Publisher's PDF, also known as Version of record

*Document license:*  
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*Citation for published version (APA):*  
Agyemang, C., & Norredam, M. (2020). Neighborhood Environment Has a Profound Association With Refugees' Health. *JAMA Network Open*, 3(8), [e2014355]. <https://doi.org/10.1001/jamanetworkopen.2020.14355>



## Invited Commentary | Global Health

# Neighborhood Environment Has a Profound Association With Refugees' Health

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Economic hardship, wars, persecution, and human rights violations continue to force many people to flee their homes and seek safety in different lands. Many of these people face treacherous journeys and risk their lives in the process of seeking safety. In 2019, approximately 70.8 million people around the world were forced to flee their homes, including 25.9 million refugees; more than half of these refugees were children younger than 18 years of age.<sup>1</sup> According to the United Nations High Commissioner for Refugees, in 2019, more than 63 311 people risked their lives trying to seek refuge in Europe by sea, and 1028 drowned while crossing the Mediterranean Sea. Many others died en route.<sup>2</sup>

Unfortunately, the ordeals and risks refugees encounter during their treacherous journeys do not end once they reach their destination, even in rich countries in Europe and North America. Many face an uncertain future including the risk of deportation, exploitation, racism, "3D" jobs (for dirty, dangerous, and demeaning), and poor housing often in resource-limited neighborhoods. This makes refugees particularly vulnerable to poor mental health outcomes.<sup>3</sup> A systematic review and meta-analysis found prevalence rates of 44% for depression, 40% for anxiety, and 36% for posttraumatic stress disorder among refugees; these figures are far higher compared with those of other migrant groups, such as labor migrants.<sup>3</sup> The limited evidence also suggests that some refugee populations have a high burden of cardiovascular disease (CVD) and its risk factors, such as hypertension, diabetes, and obesity.<sup>4</sup>

Although refugees are disproportionately affected by poor mental health<sup>3</sup> and CVD,<sup>4</sup> the evidence on the key specific factors driving their health disadvantages have not yet been well characterized. In *JAMA Network Open*, Hamad et al<sup>5</sup> took advantage of the natural experiment of Denmark's dispersal policy for refugee resettlement in neighborhoods of varying socioeconomic status during the 1986 to 1998 period. They evaluated the association of neighborhood deprivation with CVD risk (myocardial infarction and stroke) and risk factors (hypertension, diabetes, and hyperlipidemia) across the life course among refugees in Denmark. Hamad and colleagues found that refugees who were dispersed to more resource-limited neighborhoods were more likely to develop hypertension, diabetes, hyperlipidemia, and myocardial infarction in subsequent decades compared with those who were dispersed to less-resource-limited neighborhoods; but there was no difference in the risk of stroke. They also found that the association of increased neighborhood deprivation on hyperlipidemia was greater among younger refugees who arrived before the age of 35 years than their counterparts who arrived at older ages.

The current study by Hamad et al is unique in that it makes use of a natural experimental cohort study design based on population-level registry data spanning 3 decades in Denmark. This study combines neighborhood-level socioeconomic characteristics and health registers to estimate the association of neighborhood deprivation on CVD and CVD risk factors. In addition, large proportions of the refugees (>90%) were dispersed to the various municipalities in Denmark as they were obliged by law to do so.

Hamad et al's study findings are consistent with another natural experiment study among refugees in Sweden. In that study, refugees who were dispersed to high-deprivation neighborhoods had a 22% higher risk of diabetes compared with refugees who were dispersed to low-deprivation neighborhoods.<sup>6</sup> The association of neighborhood deprivation increased over time with 5 years of additional exposure to high-deprivation neighborhoods being associated with a 9% increase in diabetes risk. These findings among refugees corroborate earlier study results that show that the

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neighborhoods in which people live are associated with their health, including CVD and risk factors either in addition to or in interaction with individual-level factors.<sup>7,8</sup> However, most of these earlier studies were based on cross-sectional designs with several methodologic challenges including selection bias such as individuals with preexisting health problems moving to more resource-limited neighborhoods and difficulty in separating individual and neighborhood-level factors.

The study by Hamad et al showed no association between neighborhood deprivation and risk of stroke, which contrasts previous findings.<sup>7,8</sup> This may be due to the relatively young population of the refugees in this study reflecting on the low cumulative incidence of less than 3% for stroke.

A major limitation of the current study by Hamad et al is the lack of information on specific deprivation factors, such as availability of healthy foods, walkability, and stressors in neighborhoods, that may underlie the high risk of CVD risk factors in refugees. Notwithstanding this limitation, 2 main theories have been proposed to explain the relatively poor health among people living in resource-limited neighborhoods: a psychosocial theory and a neomaterial theory.<sup>9</sup> The psychosocial theory postulates that neighborhood stressors create unpleasant feelings among the residents in the neighborhood, and this affects their health behavior (inappropriate coping strategies) and biology (psycho-neuro-endocrine mechanisms), which subsequently increases their vulnerability to diseases in addition to the direct outcomes of absolute inferior material living standards. The neomaterial theory posits that the poor health outcomes of residents in resource-limited neighborhoods are due to a combination of exposure to material deprivation and a lack of individual economic resources driven by a systematic low investment in a range of human, physical, health and social infrastructures. Both theories may apply to refugees as they face the double jeopardy of psychosocial stress and material deprivation. Refugees may have to deal with psychosocial stress associated with the scars of their past, including experiences of war, torture, and other human rights abuses, which they endured before or during their treacherous journeys, and the challenges in the new destination such as discrimination and poor economic opportunities. Refugees who find themselves in resource-limited neighborhoods may be poorly equipped to deal with past and present psychosocial stress, which may increase their risk for CVD risk factors.<sup>9</sup> Physical features of neighborhoods, such as availability of healthy foods, walkability, and social attributes, such as safety, social support, and community social cohesion, can influence promotion or maintenance of a healthy lifestyle. Refugees living in low-income neighborhoods may have restricted food choices and walkability, and they may be exposed to high levels of neighborhood crime compared with peers living in high-income neighborhoods. Both of these factors can affect health behaviors and thereby contribute to the high risk of CVD risk factors in refugees.

These current findings do not bode well for the future for refugees and other vulnerable groups living in resource-limited neighborhoods. The Scandinavian countries are often regarded as countries with free access to health care and low levels of inequalities. However, refugees are still disadvantaged in Danish society, with high unemployment, low income rates, and limited opportunities for leaving low-income neighborhoods to more affluent neighborhoods. Nevertheless, if neighborhood status is associated with CVD risk factors among refugees living in a rather egalitarian society, then it is expected that the association of neighborhood status with CVD risk factors among refugees living in more unequal societies will be much greater.

The study by Hamad et al suggests that government policies, such as dispersal policies, can influence migrants' health. With rising new national immigration policies, there is a clear need for more research to evaluate the effect of these policies on migrants' socioeconomic development and health outcomes. There is also a need for research on the pathways through which neighborhood deprivation is associated with the risk of CVD and risk factors among vulnerable populations including refugees, with a goal of assisting in public health prevention efforts. Finally, special attention from governments is required in developing policies that protect and promote refugees' health and well-being.

## ARTICLE INFORMATION

**Published:** August 21, 2020. doi:10.1001/jamanetworkopen.2020.14355

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**Conflict of Interest Disclosures:** None reported.

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